



MEMO

To: Gerri Caruso
CITY OF SUNNYVALE, Community Development Department

From: Michael McCormick

Date: January 14, 2011

Re: Climate Action Plan: Approach to Reduction Measure Impact Analysis

At the request of the Committee, we summarized the proposed methodology for assessing and prioritizing the City's greenhouse gas (GHG) reduction measures. The Climate Action Plan will include an analysis of the GHG reduction potential, annualized cost, and co-benefits of each measure. We look forward to discussing this proposed methodology and receiving your comments at the January 19, 2011 Committee meeting.

Following our discussion, PMC will complete the impact analysis and present it to the Committee on March 2, 2011 in advance of the Administrative Draft Climate Action Plan to inform the Committee's prioritization process. Our expectation would be that the March 2nd Committee meeting would result in a formal recommendation regarding the prioritized Goals, Policies and Actions.

QUANTIFICATION METHODOLOGY

ANALYSIS YEARS

The annual impact of potential reduction measures are quantified for two years: 2020 and 2035. The 2020 analysis will be used to determine consistency with the greenhouse gas reduction targets of Assembly Bill (AB) 32. The 2035 analysis will be used for comparison with Senate Bill (SB) 375 targets and consistency with the goals of Governor's Order S-03-05.

REDUCTION TYPES

The GHG reduction potential of each measure is determined by a change in operation, activity, or efficiency. In general, there are three types of reductions in climate action plans: 1) avoided emissions, 2) greater efficiency, and 3) sequestration. Avoided emissions are emissions that are prevented from being released by changed behaviors. For example, if a trip that was usually taken by car is now taken by bicycle or foot, the tailpipe emissions from the car trip would be considered avoided emissions.

Greater efficiency reductions come about when a behavior or activity cannot be avoided, but can be done in a more efficient or less GHG-dependent way. For

instance, a driver could use a gas-electric hybrid or plug-in hybrid instead of a traditional gasoline powered vehicle. Similarly, a person could use a renewable energy source like solar or wind instead of fossil fuel power.

Lastly, sequestration refers to emissions that are absorbed or taken out of the atmosphere through biological, chemical, or physical processes. For instance, an increased rate of tree planting can lead to greater GHG sequestration when the trees reach maturity. However, unless a baseline inventory of sequestration has been completed, a local government cannot calculate the increase or decrease in future sequestration rates. Sunnyvale does not have a baseline sequestration inventory, therefore future sequestration benefits will only be provided as an information item and not as a GHG reduction. Additionally, state protocols advise against including emission sinks in a local government inventory or reduction plan due to lack of certainty.

TOOLS AND RESOURCES

Whenever possible, emission reduction estimates are based on tools and reports provided by government agencies such as the US EPA, Cal/EPA, CEC, CARB, and local air districts. If accurate reduction estimates are not available through these tools, a case study may be used if the case study is comparable to the conditions in the city. Finally, for more long-range reduction measures that lack actual on-the-ground testing or analysis, current research is combined with knowledge of existing city practices to create a defensible estimate of future emissions reductions.

GHG Emission Reduction Estimates: Steps to reach highest level of specificity



EXAMPLE

Provided below is an example and description of the steps taken to quantify each measure. The sources used in quantifying this particular measure come from a combination of GHG inventory data, research, and an implementation goal.

GHG Reduction Measure: Car Sharing - Promote the use of carsharing in Sunnyvale in order to establish and maintain at least one viable car share operation within the City by 2020.

Car sharing gives access to vehicles on an as-needed basis through a subscription-based program. They are successful in residential neighborhoods, commercial centers, and at transit centers. For this measure, the California Air Pollution Control Officers Association (CAPCOA) provides a recommended methodology as follows.

Sample GHG Calculation:

	Description	Factor	Source
A	% reduction in car-share member annual VMT	37%	Millard-Bail, 2005.
B	Number of car share members per shared car	20	Cambridge Systematics, 2009.
C	Population per shared car based on suburban context	2,000	Cambridge Systematics, 2009.
D	Percent VMT reduction	0.0037	Calculation = A * B * C
E	Annual VMT Reduction in 2020	18,500	Calculation = D * 2020 VMT (Inventory)*
F	Annual GHG Reduction in 2020 (Metric Tons CO ₂ e)	480	Calculation = E * Emission factor for passenger cars (Inventory)*

* Please note that the 2020 Vehicle Miles Traveled (VMT) analysis has not been completed for Sunnyvale, so this calculation uses a placeholder of 300,000,000 miles per year and an emissions factor of 0.0004 metric tons CO₂e/mile.

Sources:

Millard-Bail, Adam. 2005. Car Sharing: Where and How it Succeeds. Transit Cooperative Research Program.

Cambridge Systematics. 2009. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Technical Appendices.

For this measure, staff would monitor the number of residents and businesses subscribing to a car share program. This would allow them to track the assumption made in row C, above, and thus the City's progress towards achieving the GHG reduction estimates.

In terms of cost, car share programs are a private initiative. There will be time for staff to work with a car sharing program for initial start up. PMC will work with the City to identify the staff needs for a car sharing program and then represent that cost on an annualized scale. Cost will be in current (2010) dollars.

NEXT STEPS

These draft measures and the accompanying quantification will require additional staff and committee input and confirmation that the assumptions, goals, or details identified within each calculation are realistic and achievable. The CAP implementation plan will identify the time frame, the responsible agency or department, the annualized costs and/or savings, and any indicators that can be used to measure progress or success. Wherever there may be insufficient information for PMC to determine the specifics of a program, staff will be responsible for identifying the timeframe, costs/savings, or indicators that may already be tracked by the City. Below is a description of the ranges we will use to complete these measures.

Descriptions of options for cost and timeframes

City Costs and/or Savings	
Cost in Dollars	Qualitative Description
0	Negligible
\$1-\$25,000	Low
\$25-\$100,000	Low-Mid
\$100,000-\$500,000	Medium
\$500,000-\$1,000,000	Medium-High
Over \$1,000,000	High

Timeframe	
This Year	Immediate
By 2015	Short-Term
By 2020	Mid-Term
By 2035	Long-Term

We look forward to staff's review and comments. Please let me know if we can provide additional information or answer questions about the measures or the process.